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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,109	03/04/2002	ZiQing Li	MCS-052-01B	5913

			EXAMINER
27662	7590	12/15/2004	KIM, CHONG R

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ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/091,109	LI ET AL.
	Examiner	Art Unit	
	Charles Kim	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-16* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) *1 and 3-15* is/are allowed.

6) ☒ Claim(s) *16* is/are rejected.

7) ☒ Claim(s) *2* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *04 March 2002* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some *   c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/14/03*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Objections

The following quotation of 37 CFR § 1.75(a) is the basis of objection:

(a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.

1.   Claim 2 is objected to under 37 CFR § 1.75 (a) and (d)(1) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

Referring to claim 2, the phrase "the non-face training examples" in line 4 lacks antecedent basis. It appears that the applicant intended the phrase to read "non-face training examples". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 16, the phrase "to ensure the inclusion of a weak classifier in the set of weak classifiers in lower overall performance in the form of increased processing time" in lines

10-12 renders the claim indefinite because it is unclear what is being claimed. For examination

purposes, the phrase will be interpreted as "to ensure the inclusion of a weak classifier in the set

of weak classifiers <u>will</u> lower overall performance in the form of increased processing time" as

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination

of the article entitled "Improved Boosting Algorithms Using Confidence-rated Predictions" by

Schapire et al., ("Schapire") and the article entitled "Floating Search Methods for Feature

Selection with Nonmonotonic Criterion Functions" by Pudil et al., ("Pudil").

Referring to claim 16 as best understood, Schapire discloses a computer-readable

medium having computer-executable instructions for boosting the performance of a classifier in

a statistical based machine learning system, the computer executable instructions comprising

        a.   identifying a set of weak classifiers each of which is associated with a feature

found in a plurality of training examples, said weak classifiers collectively best classifying the

training examples (pages 3-5, section 2);

        b.   linearly combining each of the weak classifiers in the identified set of weak

classifiers to define a strong classifier (pages 3-5, section 2).

Schapire further disclose that the action of identifying the set of weak classifiers comprises using a sequential forward search for optimal weak classifiers (pages 3-5, section 2), but does not disclose the use of backtracking to ensure the inclusion of a weak classifier in the set of weak classifiers will lower overall performance in the form of increased processing time.

Pudil discloses a sequential forward search algorithm for classifiers with backtracking to ensure the inclusion of a classifier in a set of classifiers will lower overall performance in the form of increased processing time (non-monotonicity) [pages 2-5].

Schapire and Pudil are combinable because they are both concerned with classifier-based pattern recognition systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Schapire's sequential forward search algorithm so that it includes the backtracking technique of Pudil. The suggestion/motivation for doing so would have been to improve the recognition/classification performance of the system (Pudil, pages 4-5), while providing good compromise between computational efficiency and performance (Pudil, page 7). Therefore, it would have been obvious to combine Schapire with Pudil to obtain the invention as specified in claim 16.

Allowable Subject Matter

4.   Claims 1, 3-15 are allowed.

5.   Claim 2 would be allowable if rewritten to overcome the claim objection, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

6.   The following is an examiner's statement of reasons for allowance: the essential

difference from the prior art is iteratively repeating the steps of: a) conditionally removing the

least significant classifier from the set of optimized weak classifiers until the removal does not

result in a lower overall cost, and b) adding the most significant classifier from the set of weak

classifiers to the set of optimized weak classifiers and performing step (a) until the number of

optimized weak classifiers equals the predetermined maximum number of classifiers or until the

overall cost function becomes less than the predetermined maximum allowable cost. These

features in combination with the other elements of the claim and the base claim are not disclosed

or suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the

payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for

Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

a.   Schapire et al. U.S. Patent No. 6,453,307 discloses a method for obtaining a

strong classifier from a combination of weak classifiers implementing the "AdaBoost" algorithm.

b.   "Learning to Detect Multi-View Faces in Real-Time" by Li et al. discloses a

method for obtaining a strong classifier from a combination of weak classifiers implementing the
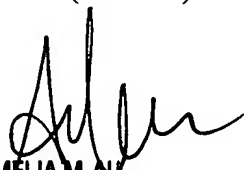
"FloatBoost" algorithm.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The

examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am

to 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ck

December 7, 2004

AMELIA M. AU
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